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AF/3729

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PTO/SB/17 (10-03)

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003, Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 330.00

## Complete if Known

Application Number	09/625,135-Conf. #8471
Filing Date	July 25, 2000
First Named Inventor	Robert M. Japp
Examiner Name	A. D. Tugbang
Art Unit	3729
Attorney Docket No.	20135-00290-US

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number 09-0457

Deposit Account Name IBM Corporation (Endicott)

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	330.00
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid SUBTOTAL (3) (\$) 330.00

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$) 0.00

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims  \*\* =  x  =   
Independent Claims  \*\* =  x  =   
Multiple Dependent  =

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1202	18	2202	9	Claims in excess of 20	
1201	86	2201	43	Independent claims in excess of 3	
1203	290	2203	145	Multiple dependent claim, if not paid	
1204	86	2204	43	** Reissue independent claims over original patent	
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) (\$) 0.00

\*\*or number previously paid, if greater; For Reissues, see above

SUBMITTED BY		(Complete if applicable)	
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		Date	March 26, 2004

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APR 01 2004

TECHNOLOGY CENTER R3700



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Robert M. Japp et al.

Serial No.: 09/625,135

Art Unit: 3729

Filed: July 25, 2000

Examiner: Anthony D. Tubang.

For: Composite Laminate Circuit  
Structure and Methods of  
Fabricating

Atty Docket: END919990082US1

APPELLANT'S BRIEF

Attention: Board of Patent Appeals and Interferences  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the Primary Examiner's final rejection of claims 8-17.

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is the assignee of the application, International Business Machines Corporation

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant, Appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

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### III. STATUS OF CLAIMS

Claims 1-17 are in the application. Claims 8-17 are finally rejected and are on appeal. Claims 1-7 are directed to a non-elected invention and have been withdrawn.

### IV. STATUS OF AMENDMENTS

No amendment has been filed after final rejection.

### V. SUMMARY OF INVENTION

The present invention relates to methods for fabricating laminate circuit structures, and more particularly to fabricating composite laminate circuit structures constructed from a plurality of modularized circuitized voltage plane subassemblies bonded together. The present invention provides for planar, fine line external circuit flat lines and does not require an additional adhesive sheet or glass cloth reinforcement (page 1, lines 6–14 of the specification).

The present invention makes possible thinner laminate circuit structures, and therefore making possible higher density PCBs with fewer processing steps. The subject invention teaches new ways to form 2S1P and 0S1P components using novel methods, some of which also simplify or solve problems of how to adhere these components together into a composite, in some cases without the corresponding increase in composite thickness necessitated by the prior art (page 2, line 30 to page 3, line 2 of the specification).

The present invention improves and simplifies the process for customizing the power planes as well as opening up numerous new possibilities in methods to construct the component cores (page 3, lines 5–7 of the specification). The present invention comprises novel ways for adhering together the subassemblies (page 3, lines 8–9 of the specification).

More particularly, the present invention relates to a method for fabricating a laminate circuit structure assembly (page 4, lines 12–13 of the specification).

The method comprises providing at least two modularized circuitized voltage plane subassemblies wherein each of the subassemblies comprise at least two signal planes disposed about an internal voltage plane (page 4, lines 13–15 of the specification).

The signal planes each have an external surface and an internal surface (page 4, lines 15–16 of the specification).

Dielectric material is located between the signal and voltage planes (page 4, lines 16–17 of the specification) and also on each external surface of each signal plane (page 4, line 19 of the specification).

An uncured or partially cured curable dielectric composition is located between the subassemblies (page 4, lines 20–21 of the specification). The dielectric composition comprises the same dielectric used in the subassemblies (page 3, lines 29–30 of the specification).

Optionally, an interposer can be located between the subassemblies wherein the interposer comprises dielectric layers that are disposed about an internal electrically conductive layer (page 4, lines 26–28 of the specification). The subassemblies are aligned and laminated to cause bonding of the subassemblies (page 4, lines 29–30 of the specification).

## VI. ISSUES

- A. Has the examiner established that Claims 8, 11-13 and 16 are anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 4,868,350 to Hoffarth, et al.?
- B. Has the examiner established that Claims 9, 10, 14 and 15 are obvious and therefore unpatentable under 35 USC 103(a) over Hoffarth et al. in view of U.S. Patent 4,755,911 to Suzuki?
- C. Has the examiner established that Claim 17 is obvious and therefore unpatentable under 35 U.S.C. § 103 (a) over Hoffarth in view of U.S. Patent No. 4,788,766 to Burger, et al.?

## VII. GROUPING OF CLAIMS

For each rejection of the claims, the involved claims stand or fall together.

## VIII. ARGUMENTS

### A. U.S. Patent No. 4,868,350 to Hoffarth, et al. fails to anticipate Claims 8, 11-13 and 16

Claims 8, 11-13 and 16 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,868,350 to Hoffarth, et al. (hereinafter also “Hoffarth”). Hoffarth fails to anticipate Claims 8, 11-13 and 16.

By way of background as discussed in the specification, a conventional technique of forming a laminate circuit board structures includes forming layers of dielectric material and electrically conducting material to provide multiple layers of circuits and voltage planes. Voltage planes can be either ground plane or power planes, and are sometimes collectively referred to as power planes (page 1, lines 16–20 of the specification).

Composites constructed using 2S1P building blocks offer a number of advantages over conventional construction techniques. One of these advantages is testable impedance prior to composite lamination. The impedance is also predominately controlled by the core dielectric. This is a major advantage as core layer dielectrics are not effected by the complex geometries and fill requirements that occur at composite lamination. 2S1P's built with glass cloth free materials facilitate very high circuit density by allowing very small, laser drilled holes to be made. One very important aspect of using 2S1P's to build high density composite printed circuit boards (PCBs) is the method used to adhere the 2S1P's into a composite board (page 2, line 29–page 3, line 3 of the specification).

Prior methods of making 2S1P cores involve drilling or etching clearance holes in bare sheets, e.g., 2 oz., 1 oz. and/or .5 oz., copper and then laminating and fully curing these with conventional prepregs or coated foils to produce a core that could be circuitized forming the signal planes. Likewise, prior 0S1P's have been fabricated in similar manners. These methods are difficult to practice due to the problems associated with handling bare copper. 2S1P's can also be made by circuitizing one side of a core with the power pattern then relaminating additional prepreg or coated copper over the circuitized power pattern (page 3, lines 4–11 of the specification).

Regardless of the method used to make the 2S1P cores, they must now be stuck together using additional “sticker” materials placed between the 2S1P's and the 0S1P's. These additional sticker sheets contribute additional thickness and exacerbate all the problems associated with additional thickness (page 3, lines 12–15 of the specification).

More recently, techniques have been provided that provide a relatively inexpensive photolithographic technique of forming a composite laminate structure from individual discrete laminate structures into a composite laminate structure (page 3, lines 16–18 of the specification).

The present invention, as discussed above, provides an improved process.

Hoffarth fails to anticipate Claims 8, 11-13 and 16 since, among other things, Hoffarth does not suggest employing a dielectric composition between the sub-assemblies that is of the same material as the dielectric of the sub-assemblies. Hoffarth merely suggests employing low dielectric constant material for sub-assemblies and low dielectric material for the encapsulant binding layer, but does not disclose that such should be of the same material. The dielectric material of the subassemblies of Hoffarth is shown as sheets 12 and 12b. The other dielectric material employed in Hoffarth is that used for the encapsulant binding layer and dielectric between cores as shown in figure 4. However, neither of these dielectric materials are disclosed as necessarily being the same as the dielectric of the subassemblies as required by the present invention. Moreover, Hoffarth does not explicitly state that the encapsulant 11 should even be the same as the material between subassemblies. In fact, the material of the sub-assemblies is preferably polytetrafluoroethylene (e.g., see Column 4, lines 10-11, Claims 10 and 15), and the encapsulant is preferably epoxy or chlorotrifluoroethylene (e.g., see Column 3, Lines 47-51; Col. 4, lines 27-30). The material mentioned for that between subassemblies is epoxy or chlorotrifluoroethylene.

Moreover, the bonding layers and dielectric of the subassemblies are selected to differ since the binding is to space the dielectric from the conductive surfaces.

Furthermore, Hoffarth does not disclose the step of providing subassemblies having dielectric on each external surface of each signal plane prior to providing a dielectric composition for the laminating as required by the present claims. Hoffarth merely shows subassemblies having signal planes 19 on the encapsulant. The subassemblies or cores are then laminated together with the material for the laminating directly contacting the signal plane.

Therefore, Hoffarth fails to anticipate the above claims. In particular, anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. *See Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, USPQ2d 1081 (Fed. Cir. 1986), and *Akzo N.V. v. U.S. Interntional Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986).

There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. 102. See *Scripps Clinic and Research Foundation v. Genetech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

The law is well settled that claiming of a more specific range within a more generic range and/or claiming species from a broader group of possible compounds avoids a lack of novelty rejection. The test for anticipation is whether the claims read on the prior art disclosure, not on what the reference broadly teach.

For example, see *Akzo v. U.S. International Trade Commissioner*, 1 USPQ2d 241 (Fed. Cir. 1986). In *Akzo*, the claims that were drawn to a process for making aramid fibers using a 98% sulfuric acid were not anticipated by a reference using a concentrated sulfuric acid solution. The disclosure of a concentrated sulfuric acid was not deemed an inherent disclosure of the more specific 98% sulfuric acid.

The court further found that no anticipation exists when one would have had to “randomly pick and choose among a number of different polyamides, a plurality of solvents and a range of inherent viscosities” to reach the claimed invention.

Also see *In re Kollman, et al.* 201 USPQ 193 (CCPA-1979) wherein the court held that the prior art generic disclosure contains “no suggestion of the required FENAC/diphenyl ether ratio.”

*In Rem-Cru Titanium v. Watson* 112 USPQ 88 (D.D.C-1956), the prior art showed alloys having broad ranges which included the claimed ranges. However, the prior art did not explicitly disclose the more limited ranges or alloys having the characteristics of the claimed alloy, which is analogous to the present case. Accordingly, the court held the claims to be allowable. For a similar factual pattern and same holding, please see *Becket v. Coe* (CA, DC 1938) 38 USPQ2d and *Tarak v Watson* (DC-DC 1954) 103 USPQ 78.

Also, see *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Ortho-Peadics, Inc.* 24 USPQ2d 1321 (Fed. Cir. 1992). Here the court held that although the claims may be

subsumed in a prior art reference generalized disclosure, this is not literal identity. The reference ranges were “so broad as to be meaningless” and provided no guidelines on how to construct a product with the invention’s attributes.

Furthermore, the cited references do not inherently disclose the present invention. For instance, see *In re Robertson, et al* 49 USPQ2d 1949 (1999 Fed. Cir.). In this case, Robertson filed a patent application concerning a paper diaper. The application claimed a paper diaper having (a) two fasteners so that the diaper could be worn on a baby and (b) a third fastener for rolling up and fixing the used diaper. The Patent Office rejected the invention under 35 USC 102 based on “Principles of Inherency” as the invention is “anticipation” by the prior art.

The prior art (Wilson) relied upon disclosed a diaper which had two snaps in front and back of the diaper in order to be worn by a baby and which may further have a strip in order to fasten the diaper to baby’s body. Wilson describes that the used diaper can be easily dealt with by rolling up and fixing it with the snaps. Accordingly, the Patent Office considered that the diaper of Wilson inherently has an ability to be rolled up and fixed after use and decided that the claimed diaper is anticipated by the diaper of Wilson. The Federal Circuit; however, held that it is recognized that the constitution of the invention is inherently present in the prior art, only when it is clearly shown that the constitution of the invention is necessarily present in the prior art by external evidence. The invention can not be rejected based on “inherency” because of probability or possibility of the presence of the constitution in the prior art. Also see *Crown Operations International Ltd. V. Solutia* 24 USPQ 2d 1917 (Fed. Cir. 2002).

B. Hoffarth et al. in view of U.S. Patent 4,755,911 to Suzuki does not render obvious Claims 9, 10, 14 and 15.

Claims 9, 10, 14 and 15 were rejected under 35 USC 103(a) as being unpatentable over Hoffarth et al. in view of U.S. Patent 4,755,911 to Suzuki. Suzuki fails to overcome the above discussed deficiencies of Hoffarth with respect to rendering unpatentable the present claims.

Suzuki does not suggest an interposer comprising dielectric layers disposed about an internal electrically conductive layer as recited in these claims. Moreover, Suzuki does not relate to laminating subassemblies of the type to which the claims are directed. Instead, the layers 2, 3



and 4 in Suzuki are actually circuit boards not interposes between subassemblies. Also, Suzuki requires employing a porous, expanded polytetrafluoroethylene to bond the circuit boards together. Moreover, Suzuki requires adhesive dots to bond the PTFE, which is contrary to the objectives of the present invention.

Accordingly, even if, Suzuki were combined with Hoffarth, the present invention would still not be disclosed.

C. Hoffarth in view of U.S. Patent No. 4,788,766 to Burger, et al. does not render obvious Claim 17.

Claim 17 was rejected under 35 U.S.C. § 103 (a) as being unpatentable over Hoffarth in view of U.S. Patent No. 4,788,766 to Burger, et al. Burger, et al. was relied upon for a disclosure of laminating subassemblies employing temperatures of at least 155°C, a time of 15 minutes and a pressure of 125 psi.

Burger, et al. fail to overcome the above discussed deficiencies of Hoffarth with respect to rendering unpatentable the present invention. Therefore Claim 17 is patentable for at least those reasons as to why Claim 8 is patentable.

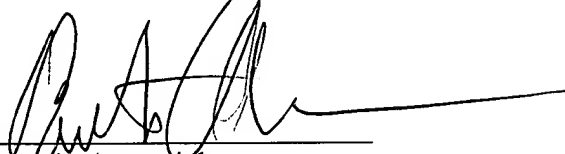
Conclusion

In view of the above, it is abundantly clear that the Primary Examiner erred in finally rejecting claims 8-17. Therefore, it is respectfully requested that the Board reverse the Examiner and allow claims 8-17.

In the event the Examiner deems necessary any further cooperation to further the prosecution of this application, Applicants urge the Examiner to contact the undersigned.

Dated: 3-26-04

Respectfully submitted,

By   
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Attorneys for Applicant



## APPENDIX – CLAIMS ON APPEAL

8. A method for fabricating a laminate circuit structure assembly which comprises: providing at least two modularized circuitized voltage plane subassemblies wherein each of the subassemblies comprise at least two signal planes having an external and internal surface disposed about an internal voltage plane; providing dielectric between the signal and voltage planes; and providing dielectric on each external surface of each signal plane; and providing a non-cured or partially cured curable dielectric composition between the subassemblies wherein the dielectric composition comprises, the same dielectric used in said subassemblies, aligning the subassemblies, and then laminating to cause bonding of the subassemblies.
9. The method of Claim 8, which further comprises: locating an interposer between the subassemblies wherein the interposer comprises dielectric layers disposed about an internal electrically conductive layer.
10. The method of Claim 9, wherein dielectric of at least one of the surfaces that is to be bonded is from said dielectric composition.
11. The method of Claim 8, wherein vias are disposed within each subassembly for providing electrical communication between signal planes and electrical connection to another subassembly.
12. The method of Claim 11, wherein the vias through the signal planes are plated with a conductive metal.
13. The method of claim 11, wherein the vias are filled with conductive adhesive.
14. The method of Claim 9, wherein the internal electricity conductive layer of the interposer is copper.
15. The method of Claim 9, wherein the interposer is about 3 to about 10 mils thick.

16. The method of Claim 8, which comprises: providing top and bottom circuit layers on top and bottom external surfaces of the assembly.

17. The method of Claim 8, wherein the laminating is carried out at about 100 to about 200°C, for about 15 minutes to about 90 minutes, and at a pressure of about 100 to about 500 psi.